

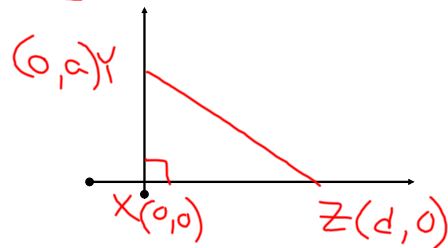
## 4-7 Triangles and Coordinate Proof

Tips

1. Use Origin as vertex or center
2. At least one side on x-axis
3. 1st Quadrant if possible
4. Use easiest coordinates possible

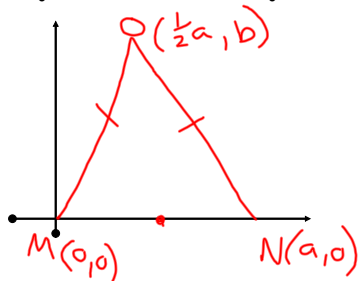
## Example 1

Right triangle XYZ with hypotenuse YZ  
 $XZ = d$  units long



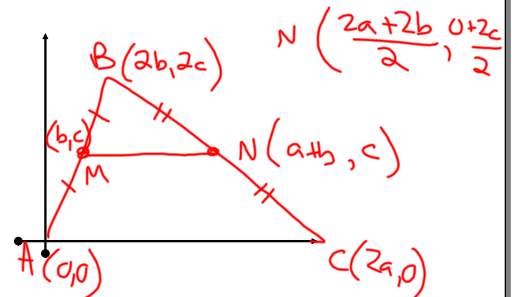
## Example 2

Isosceles triangle MNO with base MN a units long



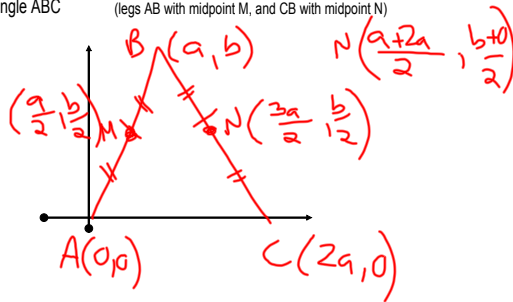
## Example 3

A line segment, MN, joins the midpoints of 2 sides of  $\triangle ABC$   
 (When using midpoint formula, then use even numbers.)



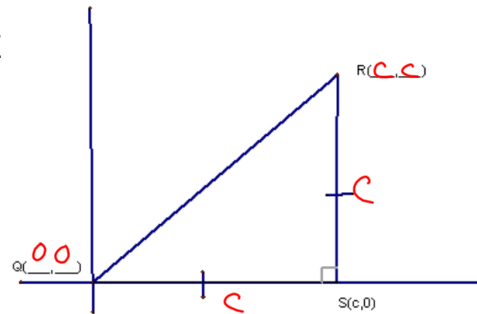
Example 4

Isosceles triangle ABC

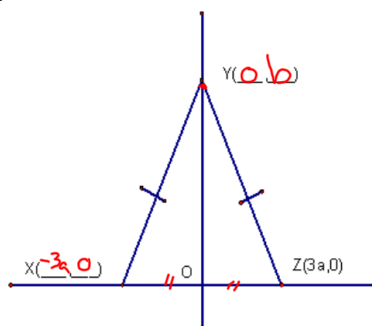
(legs  $\overline{AB}$  with midpoint M, and  $\overline{CB}$  with midpoint N)

Fill in the missing coordinates.

E



Ex 2:



Coordinate Proof

Distance Formula  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ 

Slope

parallel - same  
⊥ lines - opp. recipr

Midpoint Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

When using midpoint formula, then use even numbers.

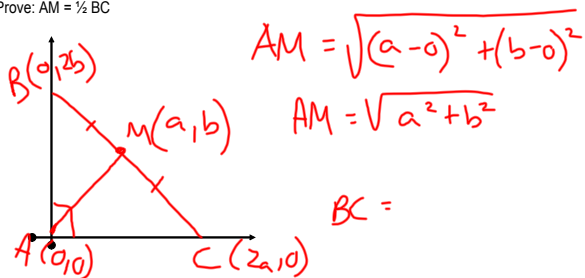
Example

Prove that the measure of the segment that joins the vertex of a right  
midpoint of the hypotenuse =  $\frac{1}{2}$  the measure of the hypotenuse

$\angle$  in a right  $\triangle$  to

Given: Right  $\triangle ABC$  with hypotenuse  $BC$ . ( $M$  is the midpoint of  $BC$ .)

Prove:  $AM = \frac{1}{2} BC$



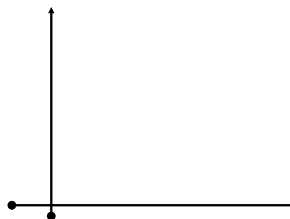
p. 225 #25

25. The segments joining the vertices to the midpoints  
of the legs of an isosceles triangle are congruent.

Given: Isosceles triangle  $ABC$ .

(legs  $AB$  with midpoint  $M$ , and  $CB$  with midpoint  $N$ )

Prove:  $AN = CM$



Homework

P 224-225

10-13, 16-24, 26-28 (on paper handout)